NOTE X.

LIST OF THE HOLOTHURIANS IN THE COLLECTION OF THE LEYDEN MUSEUM

DRAWN UP BY

Prof. Dr. HUBERT LUDWIG

in Giessen.

The collection of Holothurians in the Leyden Museum was sent over to me with the request that I would subject them to a systematic revision. I undertook this task in the hope of being able at the same time by the aid of this material to make a step in advance with respect to their anatomy. Unfortunately in nearly all the specimens the intestines were so insufficiently preserved, that I was forced to limit myself to the identification of the species. This, however, was not superfluous, as the majority of the specimens were incorrectly named and as certain localities are not without interest for the question of geographical distribution. The collection of Holothurians in the Leyden Museum contains a total of 52 species (two of them being new), most of which were obtained from the Oriental and Moluccan regions.

SYNAPTIDAE.

1. ***Synapta distincta*** v. MARENZELLER.

v. Marenzeller, Verhandl. zool.-botan. Gesellsch. in Wien. 1881. p. 123. Taf. IV, Fig. 2.

A badly preserved fragment from Amoy.

2. *Synapta beselii* JÄGER.

Jäger, de Holothuriis. 1833, p. 15. Taf. I. — Semper, Holothurien. 1868. p. 264[1]). — Ludwig, Zeitschr. f. wissensch. Zool. XXXV. 1881. p.p. 576—577.

One specimen from the Indian Ocean.

3. *Synapta grisea* SEMPER.

Semper, Holothurien. 1868. p. 265.

One specimen from the Indian Ocean.

4. *Synapta vittata* JÄGER (FORSKAL sp.).

Fistularia vittata Forskal. Descriptio animalium qua in itinere orientali observavit. 1775. p. 121. Taf. 37 E. — Synapta vittata Jäger, De Holothuriis. 1833. p.p. 14—15. — Semper, Holothurien. 1868. p. 265.

One specimen without indication of locality.

This specimen agrees very well with Jäger's description. It possesses 15 tentacles. The anchors and anchor-plates resemble those of S. indivisa and S. recta Semper.

5. *Chirodota rufescens* BRANDT.

Brandt, Prodromus. 1835. p. 59. — Ludwig, Zeitschr. f. wissensch. Zool. XXXV. 1881. p.p. 578—579. — Chirodota variabilis Sluiter, Natuurk. Tijdschr. v. Nederlandsch-Indië. XL. 1880. p.p. 20—21 des Separatabdruckes. Taf. VI, Fig. 2. Taf. VII, Figs. 7—10.

Two specimens from Japan, two from Timor and two from Batavia.

6. *Chirodota laevis* LÜTKEN.

Holothuria laevis Fabricius. Fauna groenlandica. 1780. p. 353. — Chirodota laevis Lütken, Oversigt over Grönlands Echinodermata. 1857. p.p. 16—21. — Semper, Holothurien. 1868. p. 267. — Ljungman, Öfvers. K. Vetensk.-Akad. Förhandl. 1879. p. 130.

Two specimens from Greenland.

1) In this and in the following references to Semper's monograph of the Holothurians, notice has only been taken of the reference in Semper's list of synonyms, in which the remaining literature concerning the respective species will be found in full.

MOLPADIDAE.

7. *Haplodactyla australis* SEMPER.

Semper, Holothurien. 1868. p. 268.

One specimen from Timor and one from Padang.

8. *Haplodactyla hyaloeides* SLUITER.

Sluiter, Natuurk. Tijdschr. v. Nederlandsch-Indië. XL. 1880. p.p. 13—15 des Separatabdruckes. Taf. V.

One specimen from Amoy.

In the genital organs are dendritic calcareous corpuscles; the intestinal tract is without calcareous deposits; in the integument calcareous corpuscles, which resemble those figured by Sluiter, are only present in the anal region and in the anal papillae.

9. *Caudina arenata* STIMPSON (GOULD sp.)

Chirodota arenata Gould, Invertebrata of Massachusetts. 1841. p.p. 345 and 346. — Stimpson, Smithson. Contrib. to Knowledge. Vol. VI. 1854. p. 17. — Semper, Holothurien. 1868. p. 268.

Eight specimens from Grand Manan.

10. *Eupyrgus scaber* LÜTKEN.

Lütken, Oversigt over Grönlands Echinodermata. 1857. p.p. 23—24. — Semper, Holothurien. 1868. p. 268. — Ljungman, Öfvers. K. Vetensk.-Akad. Förhandl. 1879. p. 130.

One specimen from Greenland.

DENDROCHIROTAE.

11. *Cucumaria frondosa* FORBES (GUNNER sp.)

Holothuria frondosa Gunner, Art. Holm. 1767. p. 115. Tab. IV, Figs. 1—2. — Cucumaria frondosa, Forbes. Hist. Brit. Starf. 1841. p. 209. — Semper, Holothurien. 1868. p.p. 268—269. — Ljungman, Öfvers. K. Vetensk.-Akad. Förhandl. 1879. p. 127.

Two specimens from the Shetland Islands, one from Greenland, three from Grand Manan, one from the Bay of Fundy, from a depth of 40 fathoms, and one specimen without indication of locality.

12. ***Cucumaria planci*** v. MARENZELLER.

v. Marenzeller, Verh. zool.-bot. Gesellsch. Wien. 1874. p.p. 300—303. — Ludwig, Mittheil. zool. Stat. Neapel. I. 1879. p. 565.

Two specimens from the Mediterranean.

13. ***Cucumaria syracusana*** SARS (GRUBE sp.)

Cucumaria syracusana Sars, Bidr. til Kundskab. om Middelhav. Littoralfauna. 1857. p.p. 123—125. Tab. I, Figs. 24—29. — Cladodactyla syracusana, Grube. Actin. Echinod. u. Würmer d. Adriat. u. Mittelm. 1840. p. 40. — Ludwig, Mittheil. zool. Stat. Neapel. I. 1879. p. 567.

Four specimens from the Mediterranean.

14. ***Cucumaria grubei*** v. MARENZELLER.

v. Marenzeller, Verh. zool.-bot. Gesellsch. Wien. 1874. p.p. 305—306. — Ludwig, Mittheil. zool. Stat. Neapel. I. 1879. p. 566.

One specimen from the Mediterranean.

15. ***Cucumaria köllikeri*** SEMPER.

Semper, Holothurien. 1868. p. 271. — Ludwig, Mittheil. zool. Stat. Neapel. I. 1879. p. 567.

One specimen from the Mediterranean.

16. ***Cucumaria frauenfeldi*** n. sp.

Semper notices, on p. 236 of his monograph of the Holothurians, a Cucumaria from Java in the Vienna Museum, which v. Frauenfeld intended to describe. He figures the calcareous corpuscles of this species on Pl. XXXIX, fig. 22. According to Semper this species belongs to the group of Cucumaria frondosa, notwithstanding its being provided with rather numerous calcareous corpuscles. Among the Holothurians of the Leyden Museum I find three specimens of a Cucumaria, which I take to be identical with the Vienna specimen on account of their appearance and of the shape of the calcareous corpuscles. One of the specimens is labelled: Cape of Good Hope; the two others bear no indication of locality. To avoid confusing the literature any further by this nameless species, I have taken leave to name it after Mr. v. Frauenfeld.

17. ***Ocnus javanicus*** SLUITER.

Sluiter, Natuurk. Tijdschr. v. Nederlandsch-Indië. XL. 1880. p.p. 9—12 des Separatabdruckes. Taf. IV.

One specimen from Java and two typical specimens also from Java, presented to the Museum by Sluiter.

18. ***Colochirus quadrangularis*** SELENKA (LESSON sp.)

Holothuria quadrangularis Lesson, Centur. Zoolog. 1830—32. p.p. 90—91. Taf. 31. Fig. 1. — Colochirus quadrangularis Selenka. Zeitschr. f. wissensch. Zool. XVIII. 1868. p. 112 (partim). — Semper, Holothurien. 1868. p. 271.

One specimen from Macassar and one from Sumatra.

19. ***Colochirus tuberculosus*** SEMPER (QUOY et GAIMARD sp.)

Holothuria tuberculosa Quoy et Gaimard, Voy. de l'Astrolabe. Zool. T. IV. 1833. p. 131. — Semper, Holothurien. 1868. p. 271.

Three specimens from Amoy and one from Macassar.

20. ***Pseudocucumis acicula*** LUDWIG (SEMPER sp.)

Ludwig, Arbeiten zool. zootom. Institut Würzburg. II. 1874. p. 14. Fig. 17. — Semper, Holothurien. 1868. p. 270.

One specimen from Ceram.

21. ***Actinocucumis typica*** LUDWIG.

Ludwig, Arbeiten zool. zootom. Institut Würzburg. II. 1874. p.p. 15—16. Fig. 24.

One specimen from Amoy.

22. ***Psolus phantapus*** JÄGER (STRUSSENFELDT sp.)

Holothuria phantapus Strussenfeldt, Art. Holm. 1765. p. 265. Taf. 10. — Psolus phantapus Jäger, De Holothuriis. 1833. p. 21. — Semper, Holothurien. 1868. p. 272. — Ljungman, Öfvers. K. Vetensk.-Akad. Förhandl. 1879. p. 130.

One specimen from Norway.

23. ***Psolus fabricii*** LÜTKEN (DÜBEN et KOREN sp.)

Cuvieria fabricii Düben och Koren. X. Vetensk. Akad. Handling. (för 1844) 1846. p. 316. — Psolus fabricii Lütken, Oversigt over Grönlands Echinodermata. 1857. p.p. 13—15. — Semper, Holothurien. 1868. p. 272. — v. Marenzeller, Coelenterat., Echinod. u. Würmer der öst.-ung. Nordpol-Expedit. Wien. 1877. p. 32.

Three specimens from Greenland, one from Grand Manan, and one from the Bay of Massachusetts, the latter from a depth of 20—30 fathoms.

24. ***Thyone briareus*** SELENKA (LESUEUR sp.)

Holothuria briareus Lesueur, Journ. Acad. Nat. Sc. Philadelphia. Vol. IV. 1824. p.p. 161—162. — Thyone briareus Selenka, Zeitschr. f. wissensch. Zool. XVII, 1867, p. 353. — Semper, Holothurien. 1868. p.p. 272—273.

Two specimens from Charleston.

25. ***Thyonidium magnum*** n. sp.

The only available fragment, obtained at Amboina, consists of no more than the anterior body-region, measures 7.5 cm. in length and encloses no internal organs except the pharynx. The colour of the whole fragment is bright yellowish brown, the tube-feet and the tentacles being of a darker brown. Round the mouth are placed twenty larger and smaller tentacles, arranged in the way which is characteristic for the genus; the five pairs of large tentacles are 7 mm. thick at their root and are 45 mm. long; the five pairs of small ones, alternating with the others are 2 mm. thick at their root and are 7 mm. long. The insertion of the small tentacles is somewhat farther inwards than is that of the large ones. The calcareous ring has a length of 7 cm.; it is elongated posteriorly and spirally coiled, as is also the case in other species of this and of the allied genera (Cucumaria, Thyone). At the posterior end of the calcareous ring is suspended a water-tube (stone-canal) which is 2 cm. long and ends in a small truncated protuberance, and 4 tubular Polian vesi-

cles, each of which measures 15—18 cm. in length. The calcareous corpuscles of the integument are small disks measuring 0.07 mm. in length and 0.05 mm. in width. They are pierced in the middle by 4 diametrically opposite openings, and peripherally by numerous, much smaller openings.

In the direction of the longitudinal axis of the disk two vertical calcareous rods 0.04 mm. high and terminating at their tips in 2 to 4 prongs are situated on the calcareous material which separates the four larger openings. These rods are united together by a transverse bridge about on the middle of their height.

In the anterior parts of the body the tube-feet are present only on the radii; as far as I can judge from the present fragment, they are distributed further backwards on the interradii also.

A more detailed description of this species can only be given when more complete specimens are available.

ASPIDOCHIROTAE.

26. *Stichopus regalis* SELENKA (CUVIER sp.)

Holothuria regalis Cuvier, Règne animal. 1817. — Stichopus regalis Selenka, Zeitschr. f. wissensch. Zool. XVII. 1867. p.p. 317—318. Taf. XVIII. Fig. 32. — Semper, Holothurien. 1868. p. 275. — Ludwig, Mittheil. zool. Station Neapel. I. 1879. p. 569.

One specimen from Naples.

27. *Stichopus ananas* SEMPER (JÄGER sp.)

Trepang ananas Jäger, De Holothuriis. 1833. p. 24. Tab. III, Fig. 1. — Stichopus ananas Semper, Holothurien. 1868. p. 275. — Ludwig, Zeitschr. f. wissensch. Zool. XXXV. 1881. p.p. 591—592.

One specimen from the Bay of Geelvink.

28. *Stichopus chloronotus* BRANDT.

Brandt, Prodrom. 1835. p. 50. — Semper, Holothurien. 1868. p. 275. — Ludwig, Zeitschr. f. wissensch. Zool. XXXV. 1881. p. 591.

Four specimens from the Indian Ocean and one from Macassar.

29. *Stichopus variegatus* SEMPER.

Semper, Holothurien. 1868. p. 275.

Two specimens from the Indian Ocean and one from Timor.

30. *Mülleria lecanora* JÄGER.

Jäger, de Holothuriis. 1833. p. 18. — Semper, Holothurien. 1868. p. 276. — Ludwig, Zeitschr. f. wissensch. Zool. XXXV. 1881. p.p. 592—593.

One specimen from Timor.

31. *Mülleria mauritiana* BRANDT (QUOY et GAIMARD sp.)

Holothuria mauritiana Quoy et Gaimard, Voy. de l'Astrolabe Zool. T. IV. 1833. p. 138. — Mülleria mauritiana Brandt, Prodrom. 1835. p. 74. — Semper, Holothurien. 1868. p. 276.

One specimen from Padang, one from Amboina, one from Java and one without indication of locality.

32. *Mülleria echinites* JÄGER.

Jäger, De Holothuriis. 1833. p.p. 17—18. Taf. 3, Fig. 6. — Semper, Holothurien. 1868. p. 276.

Two specimens from the Indian Ocean and one from Padang.

33. *Mülleria miliaris* BRANDT (QUOY et GAIMARD sp.)

Holothuria miliaris Quoy et Gaimard, Voy. de l'Astrolabe, Zool. T. IV. 1833. p. 137. — Mülleria miliaris Brandt, Prodrom. 1835. p. 74. — Semper, Holothurien. 1868. p. 276. — Ludwig, in Kossmann's Ergebnisse einer Reise nach dem rothen Meere. 1880. p. 7 des Separatabdruckes.

One specimen from the Indian Ocean, one from Amboina, one from Padang, two from Timor and one *sine patria*.

34. *Molothuria monacaria* LESSON.

Lesson, Centur. Zool. 1830. Taf. 78. p. 225. — Semper, Holothurien. 1868. p. 276.

Two specimens from Waigeou, one from Celebes and one *sine patria*.

35. ***Holothuria decorata*** v. MARENZELLER.

v. Marenzeller, Verhandl. zool.-bot. Gesellsch. Wien. 1881. p.p. 137—139. Taf. V, Fig. 12.

One incomplete specimen from Japan was examined, which I identify with H. decorata only with considerable doubt; for although the calcareous corpuscles are the same, the integument is very thick, whereas v. Marenzeller remarks that the integument is thin.

36. ***Holothuria graffei*** SEMPER.

Semper, Holothurien 1868, p. 276.

Two specimens from Timor.

37. ***Holothuria marmorata*** SEMPER (JÄGER sp.)

Bohadschia marmorata Jäger, De Holothuriis. 1833. p.p. 18—19. — Holothuria marmorata Semper, Holothurien. 1868. p. 277. — Ludwig, Zeitschr. f. wissensch. Zool. XXXV. 1881. p.p. 594—595.

Two specimens from the Geelvink-bay and one from Amboina.

38. ***Holothuria scabra*** JÄGER.

Jäger, De Holothuriis. 1833. p. 23. — Semper, Holothurien 1868. p. 277. — Ludwig in Kossmann's Ergebnisse einer Reise nach dem rothen Meere. 1880. p. 6 des Separatabdruckes.

Three specimens from Macassar, two from Banka, one from Timor, and nine *sine patria*.

39. ***Holothuria argus*** SEMPER (JÄGER sp.)

Bohadschia argus Jäger, De Holothuriis. 1833. p. 19. Taf. 2, Fig. 1. — Holothuria argus Semper, Holothurien. 1868. p. 277.

Three specimens from Timor, one from Padang, one from Waigeou and one *sine patria*.

40. ***Holothuria vagabunda*** SELENKA.

Selenka, Zeitschr. f. wissensch. Zool. XVII. 1867. p. 334. Taf. XIX, Figs. 75—76. — Semper, Holothurien. 1868. p. 277. — Ludwig, Arbeit. zool.-zootom. Institut Würzburg. II. 1874. p.p. 36—37. Fig. 40. — Ludwig, Zeitschr. f. wissensch. Zool. XXXV. 1881. p.p. 595—596.

One specimen from Java.

41. ***Holothuria impatiens*** GMELIN (FORSKAL sp.)

Fistularia impatiens Forskal, Descript. anim. etc. 1775. p.p. 121—122. Taf. 39, Fig. B. — Holothuria impatiens Gmelin, Systema naturae. Ed. XIII. 1788. p.p. 3142—3143. — Semper, Holothurien. 1868. p. 277. — Ludwig, Arbeit. zool.-zootom. Institut Würzburg. II. 1874. p. 36. Fig. 51. — Ludwig, Mittheil. zool. Station Neapel. I. 1879. p. 569. — Ludwig, in Kossmann's Ergebnisse einer Reise nach dem rothen Meere. 1880. p. 6 des Separatabdruckes.

Two specimens from Timor, one from Banda, one from Amboina and four *sine patria.*

42. ***Holothuria tenuissima*** SEMPER.

Semper, Holothurien. 1868. p. 277.

Two specimens from the Indian Ocean, one from Timor, six from Padang and three *sine patria*

43. ***Holothuria fusco-punctata*** JÄGER.

Jäger, De Holothuriis. 1833. p. 23. — Semper, Holothurien. 1868. p. 277.

One specimen *sine patria.*

44. ***Holothuria martensii*** SEMPER.

Semper, Holothurien. 1868. p. 277.

One specimen from Celebes and one from Banda.

45. ***Holothuria verrucosa*** SELENKA.

Selenka, Zeitschr. f. wissensch. Zool. XVII. 1867. p. 338. Taf. XIX, Fig. 88. — Semper, Holothurien. 1868. p. 278.

One specimen from the Indian Ocean and two *sine patria.*

46. ***Holothuria lineata*** LUDWIG.

Ludwig, Arbeit. zool.-zootom. Institut Würzburg. II. 1874. p. 27. Fig. 42. — Ludwig, in Kossmann's Ergebnisse einer Reise nach dem rothen Meere. 1880. p. 7 des Separatabdruckes.

One specimen *sine patria.*

47. ***Holothuria pardalis*** SELENKA.

Selenka, Zeitschr. f. wissensch. Zool. XVII. 1867. p. 336. Taf. XIX, Fig. 85. — Semper, Holothurien. 1868. p. 278.

One specimen *sine patria.*

48. ***Holothuria atra*** JÄGER.

Jäger, De Holothuriis. 1833. p. 22. — Semper, Holothurien. 1868. p. 278. — Ludwig, Zeitschr. f. wissensch. Zool. XXXV. 1881. p. 596. — Ludwig, in Kossmann's Ergebnisse einer Reise nach dem rothen Meere. 1880. p. 6 des Separatabdruckes.

Four specimens from Macassar, seven from Timor, six from Amboina, one from Padang, one from Djedda, two from the Indian Ocean and one *sine patria.*

49. ***Holothuria fusco-cinerea*** JÄGER.

Jäger, De Holothuriis. 1833. p. 22. — Semper, Holothurien. 1868. p. 278.

One specimen from Japan.

50. ***Holothuria edulis*** LESSON.

Lesson, Centur. Zool. 1830. p.p. 125—126. Taf. 46, Fig. 2. — Semper, Holothurien. 1868. p. 278.

Fifteen specimens from Amboina, four from Celebes, one from Java and one from Timor.

51. ***Holothuria rugosa*** LUDWIG.

Ludwig, Arbeit. zool.-zootom. Institut Würzburg. II. 1874. p. 34. Fig. 33.

One specimen from Waigeou.

52. ***Holothuria lubrica*** SELENKA.

Selenka, Zeitschr. f. wissensch. Zool. XVII. 1867. p. 329. Taf. XVIII. Figs. 59—60. — Semper, Holothurien. 1868. p. 279.

Two specimens from Sanghir, Molucca's.